Wetland Restoration (ACRE)

Code 657

Montana Conservation Practice Specification

GENERAL SPECIFICATION

Wetland Restoration shall be planned and installed in accordance with the Field Office Technical Guide (FOTG), Section IV–Practice Standard. This document provides additional parameters, references, recommendations, and requirements for developing site-specific plans for this practice.

PURPOSE

The purposes of this practice include restoration and rehabilitation of wetlands that have previously been otherwise degraded, drained, or altered. Additionally, see Field Office Technical Guide (FOTG), Section IV–Practice Standards and Specifications, 658–Wetland Creation for creation of a new wetland where none previously existed and/or 659–Wetland Enhancement for modification of an existing wetland to achieve a desired wetland function.

HYDROLOGY RESTORATION

An appropriate water supply for the wetland type and functions must be available to provide for the needs of the wetland being restored.

The following FOTG, Section IV–Practice Standards, Specifications, and Job Sheets will be used as appropriate:

356–Dike
378–Pond
587–Structure for Water Control
410–Grade Stabilization Structure
322–Channel Vegetation
342–Critical Area Planting
348–Dam, Diversion
582–Open Channel
584–Channel Stabilization
580–Streambank and Shoreline Protection
395–Stream Habitat Improvement and Management
644–Wetland Wildlife Habitat Management

Refer to the Engineering Field Handbook, Chapter 13, “Wetland Restoration, Enhancement, and Creation,” and Chapter 6, “Structures,” for additional design information. Also refer to the Electronic Field Office Technical Guide—MT Construction Specifications and the National Handbook of Conservation Practices—Construction Specifications for Montana. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

SOILS

Hydric soils will be used, where possible, to interpret previous wet conditions in determining the extent of the degraded wetland and to design the restoration.

SURFACE DRAINAGE REMOVAL

The fill for channel blocks will be crowned a minimum of one foot above the top of the lowest existing channel bank to account for settlement and to prevent concentrated flow over the channel block.

Where open channels were constructed to drain the wetland, the channels will be filled with earth or controlled with a grade stabilization structure to restore the wetland hydrologic conditions. A water control structure may be required to manage water levels for wetland operation and maintenance.

Provisions will be made to store, pass, or divert the flow from the 10-year frequency, 24-hour storm so that it does not cause erosion and flooding impacts.

Where the channel serves as an outlet for upstream lands, it is necessary to meet applicable state and local laws and regulations pertaining to flooding and surface and subsurface drainage.

The channel may be blocked with earth fill without a flow control device where flow duration and rate will not cause erosion and head cutting. The minimum length of the channel to be filled will be based on the hydraulic conductivity (permeability) of the soil on the site. This information can be determined from published soil survey data or from on site investigation. The minimum length to be filled is 50 feet for soils with a hydraulic conductivity of less than 0.6 inches per hour, 100 feet for 0.6 to 2.0 inches per hour, and 150 feet for greater than 2 inches per hour. The side slopes on channel blocks will be 3:1 or flatter. All fill will be compacted to achieve the density of adjacent materials. The fill for the channel block will be crowned a minimum of 10 percent–not to exceed 0.5 feet–above the top of the lowest existing channel bank to account for settlement and to prevent concentrated flow over the channel block.

In areas where subsurface drains were used to remove surface water or soil saturation, the existing system will be modified to restore the wetland hydrologic conditions. Review of drainage records, interviews, and site investigations will be needed to determine the extent of the existing system. The effect of any modification to the existing subsurface drainage system on upstream landowners will be evaluated and the landowner will be notified of potential off-site impacts. This evaluation will include both surface and subsurface impacts.

Where the subsurface drain serves as an outlet for upstream properties, it will be necessary to meet applicable state and local laws and regulations pertaining to subsurface drainage and flooding. Upstream surface and subsurface drainage will not be impacted unless appropriate easements are obtained or mitigation measures are implemented.

The effects of the subsurface drainage system may be eliminated by the following: removing a portion of the drain at the downstream edge of the site; modifying the drain with a water control device; or installing non-perforated pipe through the wetland site.

The minimum length of drain to be removed is 50 feet for soils with a hydraulic conductivity of less than 0.6 inches per hour, 100 feet for 0.6 to 2.0 inches per hour, and 150 feet for greater than 2.0 inches per hour. All filter material or other flow enhancing material will also be removed for this length. The trench will be filled and compacted to achieve a density equal to adjacent material.

A water control device placed on the inlet of an existing drain will limit inflow that will prevent damage to the drain downstream of the site. If the drain serves other areas, inflow will be limited to the capacity originally apportioned to the drain.

The water control structure will be attached to a non-perforated conduit that extends at least the minimum length previously specified for length of drain to be removed. The connections of the water control structure and the non-perforated pipe will be watertight and the head created at the maximum pool level.

GRADE STABILIZATION STRUCTURE and WATER CONTROL STRUCTURE

Fire resistant materials will be used for exposed portions of structures where vegetation will be maintained by burning.

When the 10-year frequency, 24-hour duration storm flow or base flow from snow melt or groundwater inflow results in long duration flows or high peak discharge, the channel will be filled and stabilized with a structure that meets the criteria for the FOTG, Section IV, Practice Standard 410–Grade Stabilization Structure.

STORAGE VOLUME REPLACEMENT

Where sediment, landshaping, or other activities have filled the wetland site, the storage may be replaced by excavating the fill material from the site or by construction of an earth embankment.

Sediment deposition or other fill materials will only be removed to the top of the buried hydric soil. Sediment will be removed and placed on upland sites.

If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as identified by local, state, or federal authorities.

DUGOUTS

Dugouts and potholes will meet criteria for FOTG, Section IV–Practice Standards and Specifications, 644–Wetland Wildlife Habitat Management.

Wetland dugouts may be used to restore previously filled wetlands and to develop wetlands. A wetland dugout is a constructed shallow depression area. Side slopes shall be shaped to a stable grade. All excavated material shall be spread on non-wetland sites, or will be hauled off-site. No spoil will be allowed in any drainage path.

Potholes may be developed or restored through blasting, excavation, or by restoring the hydrology to existing depression areas. Blasting is to be done by experienced personnel in accordance with federal, state, and local regulations.

VEGETATION RESTORATION

Preference shall be given to native wetland plants with localized genetic material. Plant materials collected or grown from material collected within the same MLRA as the site is considered local. Woody vegetation may need protection from beavers until established.

For forested wetland plantings, dormant pole plantings may be used for cottonwood and willow establishment. Seed planting rates and site preparation will meet the criteria of FOTG, Section IV–Practice Standards and Specifications. Seed viability will be determined prior to planting.

A vegetative buffer zone will be established in areas surrounding the wetland. The buffer will act as a filter for sediment and debris. The buffer zone must be wide enough to adequately filter overland runoff from the surrounding uplands.

VEGETATION RESTORATION CONTINUED

Planning for vegetation must begin early in the overall wetland planning process. Species selection can be effected by many factors of the design, construction, and site.

Changes in management may meet the cooperator's objectives for restoring or enhancing the wetland without implementing accelerating practices such as seeding or planting and should be considered.

Dikes, pond embankments and other engineering structures installed the association with this practice may have non-hydric soil situations and require vegetation. Refer to FOTG, Section IV–Practice Standards and Specifications, 342–Critical Area Planting for vegetation considerations.

Specify required management of water and/or animals before seeding/planting is implemented.

WETLAND FUNCTIONAL ANALYSIS

A functional assessment (Hydrogeomorphic—HGM—approach or MDT, Montana Wetland Assessment Method) will be performed on the site prior to restoration or modification. The assessment shall also be done on a suitable reference area, if available, to later evaluate the success of the restoration effort.

Restoration goals and objectives shall include targeted natural wetland functions for the wetland type and the site location as determined by the functional assessment and reference site data.

PLANS AND SPECIFICATIONS

Specification for this practice will be prepared for each site. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other documentations. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

The functional integrity of the restored wetland will be maintained.

Structures built to restore the wetland will be inspected each year for the life of the practice. Water control structures will be inspected for wear and damage so that the designed amount of water is retained in the wetland and/or delivered to the wetland. Embankments must maintain designed water levels without leakage.

Hydrology of the designed wetland must not be altered.

Functions of the designed wetland will be evaluated and maintained for the life of the practice.

REFERENCES

Hammer, D.A. 1992. "Creating Freshwater Wetlands." Lewis Publishers, Inc., Chelsea, MI. p. 298

Mitsch, J.W. and J.G. Grosselink. 1993. 2nd Edition. Van Nostrand Reinhold, New York. p. 722.

ADDITIONAL SPECIFICATIONS AND NOTES

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